EFFECT OF ARC RESISTANCE IN FAULT RESISTANCE ANALYSIS

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To my beloved parents,

Baharom Bin Rejab, Kamariah Binti Sulaiman

Brothers and Sister,

Muhammad Hakimi, Muhammad Haziq, Muhammad Hasif,

Muhammad Faiz, Nor Nabiah, Nurul Juhanis

and my wife,

Hadifnafila Binti Selamat

for their encouragement

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ABSTRACT

Fault analysis is the heart of power system component which plays an important role in solving a power system problem. The abnormal condition will tend high current flow through to the network and also faulted point. The arc resistances occurred due to fault at the point of fault and rely on the length and fault current during the fault. Meanwhile, ground resistance represented the resistance that touches the live conductor to the ground. In phase to phase fault, fault is due to arc resistance. However, in case of fault involving to ground fault, it will compose both ground resistance and arc resistance. In this project, it will focus on effect of arc resistance in fault current. The simulation will be performed into two ways which are with arc resistance and without arc resistance. CAPE software will be used to conduct simulation without arc resistance, while the developed a short circuit algorithm by using the Matlab software is used to perform simulation with arc resistance. To ensure the validity in simulation without arc resistance, results from CAPE and Matlab software will be used to make a comparison. Besides that, in simulation with arc resistance, results from Matlab and open literature will be used to prove the validity. From the result, the values of fault current and arc resistance are obeyed with the theoretical concept and it can be proven by referring to the IEEE standard error and literature.

ABSTRAK

Analisis kerosakan memainkan peranan yang penting bagi menyelesaikan masalah dalam sistem kuasa. Keadaan tidak normal berlaku akan mengakibatkan arus tinggi mengalir ke dalam sistem dan tempat kerosakkan berlaku. Rintangan arker yang berlaku di tempat kerosakan bergantung pada panjang dan arus kerosakan yang berlaku semasa kerosakan. Sementara itu, rintangan bumi menunjukkan rintangan yang menyentuh pengalir ke bumi. Dalam kesalahan fasa ke fasa, ia akan melibatkan rintangan arc. Kajian ini akan menumpukan kepada kesan rintangan arker dalam arus kerosakan mengikut jenis kerosakan yang berbeza. Di sini, kaedah menganalisis boleh dibahagikan kepada dua cara iaitu dengan membina algoritma menggunakan perisian Matlab dan melaksanakan pengesahan keputusan dengan menggunakan perisian CAPE. Ini menunjukkan, perbandingan dengan menggunakan perisian CAPE hanya boleh dilaksanakan tanpa mengambil kira rintangan arker dalam analisis yang dijalankan. Di samping itu, keputusan bagi penyelidik yang terdahulu akan digunakan untuk melaksanakan perbandingan bagi algoritma Matlab dengan mengambil kira rintangan arker dalam analisis. Bagi membuktikan hasil keputusan, asas kesalahan IEEE akan digunakan sebagai rujukan. Daripada keputusan, nilai arus kerosakan dan rintangan arker adalah dipatuhi dengan konsep teori dan ia dibuktikan dengan merujuk kepada ralat IEEE.